

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Please cancel claims 1-43, without prejudice, and add new claims 44-86 as follows:

Listing of Claims:

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- B2
1. (Canceled) An apparatus for treating vascular aneurysms, comprising:  
at least one support member having at least a first surface; and  
a reactive material selectively applied to said support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.
  2. (Canceled) The apparatus of claim 1 wherein said support member comprises a first surface and an adjacent second surface, and wherein said reactive material is applied to said first surface.
  3. (Canceled) The apparatus of claim 2 wherein said reactive material is applied to said first and second surfaces.
  4. (Canceled) The apparatus of claim 2 wherein said reactive material is applied to a portion of said first and second surfaces.
  5. (Canceled) The apparatus of claim 1 wherein said reactive material is applied to a portion of said first surface.
  6. (Canceled) The apparatus of claim 1 wherein said at least one support member further comprises said reactive material.
  7. (Canceled) The apparatus of claim 1 wherein said reactive material is integrally formed with said at least one support member.
  8. (Canceled) The apparatus of claim 1 wherein said reactive material is interwoven with said at least one support member to provide a woven structure.

9. (Canceled) The apparatus of claim 1 wherein said reactive material has a non-reacted volume of  $V$  and a reacted volume of  $V'$ , wherein  $V'$  is larger than  $V$ .
10. (Canceled) The apparatus of claim 9 wherein said reactive material is capable of obtaining a reacted volume  $V'$  in the presence of a physiological pH of about 7.4.
11. (Canceled) The apparatus of claim 1 wherein said at least one support member comprises a radially and axially flexible body member, said body member having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ .
12. (Canceled) The apparatus of claim 11 wherein said second radius of curvature  $R'$  is substantially equal to a radius of curvature of a receiving blood vessel.
13. (Canceled) The apparatus of claim 11 wherein said at least one support member comprises a vascular patch device having a radially and axially flexible patch body member formed by a plurality of interlocking support members, said patch body member having a plurality of fenestrations formed therein.
- B2 14. (Canceled) The apparatus of claim 11 wherein said at least one support member comprises a radially and axially flexible coiled bridge device having a resilient sinusoidal body member, said sinusoidal body member defining a plurality of openings.
15. (Canceled) The apparatus of claim 1 wherein said at least one support member comprises a radially and axially flexible cylindrical body member, said cylindrical body member having a first  $D$  and a second  $D'$ , wherein  $D'$  is larger than  $D$ .
16. (Canceled) The apparatus of claim 15 wherein said second diameter  $D'$  is substantially equal to a diameter of a receiving blood vessel.
17. (Canceled) The apparatus of claim 15 wherein said at least one support member comprises a radially and axially expanding helical stent having a cylindrical body member located between a first end and a second end, said cylindrical body member further defining an internal lumen in communication with said first and second ends.
18. (Canceled) An apparatus for treating vascular aneurysms, comprising:

at least one support member comprising a radially and axially reticulated expanding stent having a cylindrical body member located between a first and second end, said cylindrical body member having a plurality of fenestrations formed thereon and further defining an internal lumen in communication with said first and second ends; said at least one support member having a first D and a second D', wherein D' is larger than D, and having at least a first surface; and

a reactive material selectively applied to said support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

B<sub>2</sub> 19. (Canceled) The apparatus of claim 18 wherein said at least one support member comprises a radially and axially flexible bifurcated support device having a bifurcated body member located between a first end, a second end, and a third end, said bifurcated body member having a plurality of fenestrations formed thereon and further defining an internal lumen in communication with said first, second, and third ends.

20. (Canceled) The apparatus of claim 18 where said at least one support member is capable of being delivered to a situs in vivo and controllably released from a delivery device, said delivery device selected from the group consisting of catheters, micro-catheters, balloon catheters, expandable catheters, guidewires, wires, and elongated bodies.

21. (Canceled) The apparatus of claim 20 where said at least one support member is capable of being delivered to a situs in vivo and controllably released from a delivery device using a controllable release mechanism selected from the group consisting of mechanical, electrolytic, electro-mechanical, thermal, hydraulic, and shape-memory release mechanisms.

22. (Canceled) The apparatus of claim 18 wherein said support member further comprises at least one attachment device.

23. (Canceled) The apparatus of claim 22, wherein said at least one attachment device is selected from the group consisting of barbs, hooks, needles, spurs, and adhesive areas.

24. (Canceled) The apparatus of claim 18 wherein said support member is manufactured from at least one biologically-compatible material selected from the group consisting of platinum, gold, tantalum, titanium, stainless steel, tungsten, Nitinol, shape memory alloys, polyurethane, polytetrafluoroethylene, polyvinyl alcohol, polyester, silicone, or acrylic.

25. (Canceled) The apparatus of claim 18 wherein said support member comprises radio-opaque materials.

26. (Canceled) The apparatus of claim 18 wherein said support member comprises echo-genic materials.

B2 27. (Canceled) The apparatus of claim 18 wherein said at least one support member comprises an intra-aneurysmal neck bridge device having a bridge body member in communication with at least two engagement members, said at least two engagement members cooperatively forming a joint.

28. (Canceled) The apparatus of claim 27 wherein said intra-aneurysmal neck bridge device is capable of being inserted into a vascular aneurysm.

29. (Canceled) The apparatus of claim 27 wherein said intra-aneurysmal neck bridge device is capable of attaching to and controllably detaching from an elongated delivery apparatus selected from the group consisting of a guidewire, a tube, or a wire.

30. (Canceled) An apparatus for treating vascular aneurysms, comprising:

a vascular patch device having a radially and axially flexible patch body member formed by a plurality of interlocking support members, said support members capable of supporting vascular tissue, said support members having at least a first surface;

said patch body member having a plurality of fenestrations formed therein and having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ ; and

a reactive material selectively applied to said support members, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

31. (Canceled) An apparatus for treating vascular aneurysms, comprising:

a coiled bridge device having a radially and axially resilient sinusoidal body member formed by at least one support member, said at least one support member capable of supporting vascular tissue, said at least one support member having at least a first surface;

*B2* said sinusoidal body member defining a plurality of openings and having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ ; and

a reactive material selectively applied to said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

32. (Canceled) An apparatus for treating vascular aneurysms, comprising:

a helical stent having a radially and axially flexible cylindrical body member located between a first end and a second end, said cylindrical body member further defining an internal lumen in communication with said first and second ends;

said cylindrical body member formed by at least one support member, said at least one support member capable of supporting vascular tissue; said at least one support member having at least a first surface;

said cylindrical body member having a first diameter  $D$  and a second diameter  $D'$ , wherein  $D'$  is larger than  $D$ ; and

a reactive material selectively applied to said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

33. (Canceled) An apparatus for treating vascular aneurysms, comprising:

a reticulated expanding stent having a radially and axially cylindrical body member located between a first and second end, said cylindrical body member defining an internal lumen in communication with said first and second ends;

said cylindrical body member formed by at least one support member, said at least one support member capable of supporting vascular tissue; said at least one support member having at least a first surface;

said cylindrical body member having a first diameter  $D$  and a second diameter  $D'$ , wherein  $D'$  is larger than  $D$ ; and

B<sub>2</sub> a reactive material selectively applied to said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

34. (Canceled) An apparatus for treating vascular aneurysms, comprising:

a bifurcated vascular support device having a radially and axially flexible bifurcated body member located between a first end, a second end, and a third end;

said bifurcated body member comprising at least one support member capable of supporting vascular tissue; said at least one support member having at least a first surface;

an internal lumen located within said bifurcated body member and in communication with said first, second, and third ends

said bifurcated body member having a first diameter  $D$  and a second diameter  $D'$ , wherein  $D'$  is larger than  $D$ ; and

a reactive material selectively applied to said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

35. (Canceled) An apparatus for treating vascular aneurysms, comprising:

an intra-aneurysmal bridge device capable of being delivered into an aneurysm, said bridge device having a flexible bridge body member;

at least two engagement members in communication with said bridge body member, said at least two engagement members capable of engaging at least one wall of said aneurysm;

a joint cooperatively formed by said at least two engagement members; and

a reactive material selectively applied to said at least two engagement members, said reactive material having a non-reacted state and a reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

36. (Canceled) The apparatus of claim 35 wherein said intra-aneurysmal neck bridge device is capable of attaching to and controllably detaching from an elongated delivery apparatus selected from the group consisting of a guidewire, a tube, or a wire.

37. (Canceled) A method of treating a vascular aneurysm, comprising:

providing a device having a reactive material selected applied to at least one support member;

delivering the device to a vascular aneurysm from within a blood vessel;

supporting tissue proximate said aneurysm with said device;

permitting blood to flow through said blood vessel;

activating said reactive material disposed on said device to restrict a blood flow to said aneurysm.

38. (Canceled) The method of claim 37 wherein said step of activating said reacting material occurs in the presence of a physiological pH of about 7.4.

39. (Canceled) The method of claim 37 wherein said step of activating said reactive material further comprises the step of volumetrically expanding said reacting material.

40. (Canceled) The method of claim 37 wherein said step of delivering the device further comprises using a catheter to deliver said device to said aneurysm.

41. (Canceled) The method of claim 37 wherein said step of using a catheter to deliver said device to said aneurysm further comprises using a balloon catheter to deliver said device to said aneurysm.

42. (Canceled) The method of claim 37 further comprising inserting said device into said aneurysm.

43. (Canceled) An apparatus for treating vascular aneurysms, comprising:

B2 at least one support member; and

a reactive material strand woven with said at least one support member to provide an interwoven structure, said reacted material strand having a reacted state and a non-reacted state, wherein said reacted state is capable of restricting a blood flow to said aneurysm.

44. (New) An apparatus for treating vascular aneurysms, comprising:

at least one expandable stent having fenestrations, said expandable stent further having a substantially cylindrical body member located between a first and second end, said cylindrical body member further defining an internal lumen in communication with said first and second ends;

see what Mike thinks. wherein said at least one expandable stent is expandable between a first diameter D and a second diameter D', wherein D' is larger than D; and

individual a reactive material selectively applied to certain fenestrations of said expandable stent, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow through said fenestrations.

blocks flow

does not mean that is all precluded



45. (New) The apparatus of claim 44, wherein said reactive material is an expandable polymer.
46. (New) The apparatus of claim 44, wherein said reactive material is a hydrogel.
47. (New) The apparatus of claim 45, wherein said reactive material is responsive to pH.
48. (New) The apparatus of claim 44 wherein said reactive material is selected from the group consisting of hydrophilic polymers and hydrogels.
49. (New) The apparatus of claim 44 further comprising at least one therapeutic agent applied to at least one of said expandable stent and said reactive material.
50. (New) The apparatus of claim 49 wherein said therapeutic agent is selected from the group consisting of embolizing factors, anti-embolizing factors, anti-restenotic compounds, endothelial cell assays, compounds to promote endothelial cellular adhesion, and growth factors.
51. (New) The apparatus of claim 44 wherein said expandable stent comprises a first surface and an adjacent second surface, and wherein said reactive material is applied to certain fenestrations on at least one of said first and second surfaces.
52. (New) The apparatus of claim 51 wherein said reactive material is selectively applied to certain fenestrations on both said first and said second surfaces.
53. (New) The apparatus of claim 44 wherein said at least one expandable stent further comprises said reactive material.
54. (New) The apparatus of claim 44 wherein said reactive material is integrally formed with said at least one expandable stent.
55. (New) The apparatus of claim 44 wherein said reactive material has a non-reacted volume of  $V$  and a reacted volume of  $V'$ , wherein  $V'$  is larger than  $V$ .
56. (New) The apparatus of claim 55 wherein said reactive material is capable of obtaining a reacted volume  $V'$  in the presence of a physiological pH of about 7.4.

57. (New) The apparatus of claim 44 wherein said reactive material is configured to expand in a preferential direction when in said reacted state.

58. (New) The apparatus of claim 57 wherein said reactive material is configured to expand more along a horizontal plane than a vertical plane when in said reacted state.

59. (New) The apparatus of claim 44 wherein said expanded stent comprises a radially and axially flexible fenestrated bifurcated stent having a bifurcated body member located between a first end, a second end, and a third end, said bifurcated body defining an internal lumen in communication with said first, second, and third ends.

60. (New) The apparatus of claim 44 where said at least one expandable stent is capable of being delivered to a situs in vivo and controllably released from a delivery device, said delivery device selected from the group consisting of catheters, micro-catheters, balloon catheters, expandable catheters, guidewires, wires, and elongated bodies.

61. (New) The apparatus of claim 44 where said at least one expandable stent is capable of being delivered to a situs in vivo and controllably released from a delivery device using a controllable release mechanism selected from the group consisting of mechanical, electrolytic, electro-mechanical, thermal, hydraulic, and shape-memory release mechanisms.

62. (New) The apparatus of claim 44 wherein said expandable stent further comprises at least one attachment device.

63. (New) The apparatus of claim 62, wherein said at least one attachment device is selected from the group consisting of barbs, hooks, needles, spurs, and adhesive areas.

64. (New) The apparatus of claim 44 wherein said expandable stent is manufactured from at least one biologically-compatible material selected from the group consisting of platinum, gold, tantalum, titanium, stainless steel, tungsten, Nitinol, shape memory alloys, polyurethane, polytetrafluoroethylene, polyvinyl alcohol, polyester, silicone, or acrylic.

65. (New) The apparatus of claim 44 wherein said expandable stent comprises radio-opaque materials.

66. (New) The apparatus of claim 44 wherein said expandable stent comprises echogenic materials.

67. (New) The apparatus of claim 44 wherein said second diameter D' is substantially equal to a diameter of a receiving blood vessel.

68. (New) The apparatus of claim 44 wherein said expandable stent comprises a radially and axially expanding helical stent.

69. (New) An apparatus for treating vascular aneurysms, comprising:

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at least one expandable, woven stent having fenestrations, said expandable stent further having a cylindrical body member located between a first and second end, said cylindrical body member further defining an internal lumen in communication with said first and second ends;

wherein said at least one expandable stent is expandable between a first D and a second D', wherein D' is larger than D; and

a reactive material interwoven with said at least one expandable, woven stent, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow through said fenestrations.

*Restrict out*  
70. (New) An apparatus for treating vascular aneurysms, comprising:

at least one expandable non-cylindrical support member having at least a first surface; and

a reactive material selectively applied to a portion of said first surface of said support member, said reactive material having a non-reacted state and a reacted state, wherein said first surface is capable of being positioned near an aneurysm and said reacted material in said reacted state is capable of increasing the resistance to blood flow through to the aneurysm.

71. (New) The apparatus of claim 70 wherein said at least one expandable non-cylindrical support member comprises a radially and axially flexible body member, said body member having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ .

72. (New) The apparatus of claim 71 wherein said second radius of curvature  $R'$  is substantially equal to a radius of curvature of a receiving blood vessel.

73. (New) The apparatus of claim 70 wherein said at least one expandable non-cylindrical support member comprises:

at least one intra-aneurysmal neck bridge device having a bridge body member in communication with at least two engagement members;

said at least two engagement members cooperatively forming a joint; and

wherein said reactive material is selectively applied to said engagement members, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow to the aneurysm.

74. (New) An apparatus for treating vascular aneurysms, comprising:

an expandable vascular patch device having a radially and axially flexible patch body member comprising a plurality of interlocking support members, said interlocking support members forming a plurality of fenestrations on said patch body member;

said patch body member having a plurality of fenestrations formed therein and having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ ; and

a reactive material selectively applied to certain fenestrations of said vascular patch device, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow through said fenestrations.

75. (New) An apparatus for treating vascular aneurysms, comprising:

an expandable coiled bridge device having a radially and axially resilient sinusoidal body member formed by at least one support member, said at least one support member capable of supporting vascular tissue, said at least one support member having at least a first surface;

said sinusoidal body member defining a plurality of openings and having a first radius of curvature  $R$  and a second radius of curvature  $R'$ , wherein  $R'$  is larger than  $R$ ; and

a reactive material selectively applied to said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow through said openings.

76. (New) An apparatus for treating vascular aneurysms, comprising:

B2  
an expandable helical stent having a radially and axially flexible cylindrical body member with an external surface located between a first end and a second end, said cylindrical body member further defining an internal lumen in communication with said first and second ends;

said at least one expandable stent capable of supporting vascular tissue;

said at least one expandable stent having openings through said external surface;

said cylindrical body member having a first diameter  $D$  and a second diameter  $D'$ , wherein  $D'$  is larger than  $D$ ; and

a reactive material selectively applied to certain of said openings on said external surface of said helical stent, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow through said openings.

77. (New) An apparatus for treating vascular aneurysms, comprising:

an expandable reticulated stent having a radially and axially cylindrical body member located between a first and second end, said cylindrical body member defining an internal lumen in communication with said first and second ends;

said cylindrical body member formed by a plurality of support members, said support members capable of supporting vascular tissue;

said cylindrical body member having a first diameter D and a second diameter D', wherein D' is larger than D; and

a reactive material selectively applied to certain of said support members, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow to the aneurysm.

78. (New) An apparatus for treating vascular aneurysms, comprising:

an expandable bifurcated vascular support device having a radially and axially flexible bifurcated body member located between a first end, a second end, and a third end, said bifurcated body member having fenestrations;

said bifurcated body member comprising at least one support member having fenestrations and capable of supporting vascular tissue, said at least one support member having at least a first surface;

an internal lumen located within said bifurcated body member and in communication with said first, second, and third ends

said bifurcated body member having a first diameter D and a second diameter D', wherein D' is larger than D; and

a reactive material selectively applied to certain fenestrations of said at least one support member, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow to the aneurysm.

79. (New) An apparatus for treating vascular aneurysms, comprising:

an expandable intra-aneurysmal bridge device capable of being delivered into an aneurysm, said bridge device having a flexible bridge body member;

at least two engagement members in communication with said bridge body member, said at least two engagement members capable of engaging at least one wall of said aneurysm;

a joint cooperatively formed by said at least two engagement members; and  
a reactive material selectively applied to said at least two engagement members, said reactive material having a non-reacted state and a reacted state, wherein said reactive material in said reacted state is capable of increasing the resistance to blood flow to the aneurysm.

80. (New) The apparatus of claim 79 wherein said intra-aneurysmal neck bridge device is capable of attaching to and controllably detaching from an elongated delivery apparatus selected from the group consisting of a guidewire, a tube, or a wire.

P22 81. (New) A method of treating a vascular aneurysm, comprising:

providing an expandable support device having a reactive material selectively applied to certain fenestrations of said support device;

delivering the device to a vascular aneurysm from within a blood vessel;

supporting tissue proximate said aneurysm with said device;

permitting blood to flow through said blood vessel;

activating said reactive material disposed on said device to increase the resistance to blood flow through certain fenestrations of said support device to the aneurysm.

82. (New) The method of claim 81 wherein said step of activating said reacting material occurs in the presence of a physiological pH of about 7.4.

83. (New) The method of claim 81 wherein said step of activating said reactive material further comprises the step of volumetrically expanding said reacting material.

84. (New) The method of claim 81 wherein said step of delivering the device further comprises using a catheter to deliver said device to said aneurysm.

*B2* 85. (New) The method of claim 81 wherein said step of using a catheter to deliver said device to said aneurysm further comprises using a balloon catheter to deliver said device to said aneurysm.

86. (New) The method of claim 81 further comprising inserting said device into said aneurysm.

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